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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/619,123	07/19/2000	Alice M. Chiang	TTC-006FX	1997
207 7590 01/11/2007 WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP TEN POST OFFICE SQUARE BOSTON, MA 02109			EXAMINER JAWORSKI, FRANCIS J	
			ART UNIT	PAPER NUMBER
			3768	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/11/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

**Application No.**

09/619,123

**Applicant(s)**

CHIANG ET AL

**Examiner**

Jaworski Francis J.

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-94 is/are pending in the application.
- 4a) Of the above claim(s) 1-74 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 75-94 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

[Claims 1 – 74 stand withdrawn from consideration in this case pursuant to earlier election in the response filed on 2/19/03. Claims 75 – 94 are under examination in this case; claims 1 – 74 stand withdrawn from consideration.]

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[ Parenthesized claim numbers pertain to the specific claim or claims being addressed by the immediately preceding rejection argument.]

Claims 75-77 and 87-94 are again rejected under 35 U.S.C. 103(a) as being obvious over Daigle (US 5127409) in view of Shinomura et al (US5295485) and Mallart. (US5184623).

Daigle teaches an ultrasonic imaging system including an annular array probe 161-163, a PC platform for which a CPU is inherent in the definition of a personal computer which effects operational software as described in cols. 11 – 12, signal processing software for performing multi-dimensional Doppler processing (see col. 12 lines 10 – 20) as well as software scan conversion, see col. 12 lines 38 – 64, and display processing and display software for display on a linear or sector array scanning

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format. It would have been obvious in view of Shinomura et al to construct a system such as Daigle with a weight under 10 pounds, for example in the kilogram range, see col. 14 lines 43 – 53 of the latter, since a very large size defeats portability such as the laptop-like embodiment suggested therein. It would have been further obvious in view of Mallart col. 2 lines 3-26 that a multi-channel array would input to the beamformer since from 16 – 64 elements are typically needed to form the aperture for the scan to take place.(Claims 75, 77)..

Memory is present in terms of RF memory 211-213 characterizable as part of the PC platform per col. 10 line 63 – col. 11 line 5 In Daigle for example. (Claim 76).

Mallart otherwise teaches in col. 2 lines 12 – 26 that a linear array may comprise 128 elements.(extending above combination to claims 87 – 94).

Claims 78-80, 82, 84 –85 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Daigle (US5127409) in view of Shinomura et al and Mallart, further in view of Blackwell et al (US5173837).

The former is applied as against claim 75, with additional note that the aforementioned RF memory constitutes a digital buffer memory for effecting a delay and forward function. Daigle does not speak to the weight of the personal computer unit. However, it would have been obvious in view of Blackwell et al to use a PC weighing less than ten pounds because this facilitates maximal portability and productivity (see col. 1 lines 14-27) as these would have been advantageous in a clinical environment. (Claims 78, 84).

Daigle further notes in col. 12 lines 41 – 43 that scan conversion was conventionally practiced in both hardware and software hence having a circuit associated with the scan conversion would have been conventional. (Claim 79).

PC controls extend to the beamformer, see col. 11 lines 47 – 58. (Claim 80).

In Blackwell et al display 14, 16 is a flat panel display which contributes to the aforementioned portability and productivity. (Claim 82).

In Blackwell et al the battery-powered operation described in col. 1 lines 17 – 22 also this supports portability. (Claim 85).

Claim 81 is again rejected under 35 U.S.C. 103(a) as being unpatentable over Daigle in view of Shinomura et al and Mallart, further view of Blackwell et al as applied to claim 78 above, and further in view of Dubil et al (US4110835). Whereas the former is silent as to charge domain processing, it would have been obvious in view of the latter col. 2 lines 9 – 14 and 44 – 52 to utilize charge domain processing in a beamformer in order to avoid signal distortion and dynamic range reductions. (claim 81).

Claim 83 is again rejected under 35 U.S.C. 103(a) as being unpatentable over Daigle in view of Shinomura et al and Mallart as applied to claim 75 above, and further in view of Wilson et al (US4471785)..

The former are applied as above but are silent as to for example adaptive resolution enhancement based upon imaged data. However it would have been obvious in view of Wilson et al to adaptively control delay channels 66 in a beamformer via a central controller microcomputer 128 in order to improve image resolution by correcting for actual measured inhomogeneities in the image. (Claim 83).

Claim 86 is again rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 75 above, and further in view of Blackwell et al and Cannon et al (US5423086).

The former are applied as above, that is, Blackwell et al supporting the extension of the Daigle PC system to laptop variants in view of light weight and portability of the latter. However, it would have been obvious in view of Cannon et al Fig. 1 to provide a wireless mode for a PC such as a laptop PC in order to further enhance versatility. (Claim 86).


#### Response to Arguments

With respect to absence of a beamformer teaching, this is present in Daigle as element 220 labelled as a summation element for the channels, and in Shinomura et al this is shown as element 25 of Fig. 2.. With respect to number of elements, Mallart uses up to 128 elements as typical for a number of ultrasound array elements.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

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Francis J. Jaworski  
Primary Examiner